

Claim Amendments

Claim 1 (currently amended) A system for measuring optical characteristics comprising:

a laser producing an excitation signal;

a first frequency generator that modulates the laser;

a splitter that reflects a reference signal and transmits an interrogation signal to

a single-mode optical fiber coupled to the laser so that a coupled excitation signal is introduced into the optical fiber, wherein the coupled excitation signal is a continuous wave signal modulated at variable frequencies;

a first detector positioned to receive a radiation backscattered by the optical fiber in response to the coupled excitation signal and to output a first detector signal;

a second frequency generator phase locked to the first frequency generator and producing a second signal;

a first mixer for receiving the first detector signal and the second signal and for outputting a first mixed signal;

a second mixer for receiving the reference signal and the second signal and for outputting a second mixed signal;

a low pass filter, an analog-to-digital converter, a fast Fourier transform circuit or equivalent computer hardware and a peak capture circuit or equivalent computer hardware for processing the first and second mixed signals; and

a divider circuit or equivalent computer hardware for dividing a captured offset frequency of the first mixed signal by a captured offset frequency of the second mixed signal and providing a result to a processor.

Claims 2 - 7 (canceled)

Claim 8 (currently amended) The system of claim 1, further comprising a second detector positioned to receive radiation backscattered by the optical fiber in response to the coupled excitation signal and sensitive to a different spectrum of backscattered radiation frequencies than the first detector;

a third mixer for receiving the backscattered radiation from the second detector and the second signal and for outputting a third mixed signal

a low pass filter, an analog-to-digital converter, a fast Fourier transform circuit or equivalent computer hardware and a peak capture circuit or equivalent computer hardware for processing the third and second mixed signals; and

a divider circuit or equivalent computer hardware for dividing a captured offset frequency of the third mixed signal by a captured offset frequency of the second mixed signal and providing the result to a processor.

Claim 9 (canceled)